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Material in this report is based on information believed to be accurate at the time of publication; however, accuracy is not guaranteed. The crop production estimates result from a review of information from different sources and are based on many assumptions including estimates of land costs, levels of fertilizer use and cultural practices followed. Regional differences in crop production may result in variation in costs of production.

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ECONOMICS INFORMATION
REPORT NO. 87-04

VEGETABLE CROPS

ESTIMATED PRODUCTION COSTS

ONTARIO, 1987

by

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INTRODUCTION

Since 1948, the Economics and Policy Coordination Branch has carried out comprehensive studies of major field and horticultural crops grown in Ontario. These studies were designed to determine costs and returns of various farm enterprises, as well as the physical amounts of production inputs required.

Traditionally, data was collected by means of farmer interviews. Published reports of these studies in the form of county, regional and provincial averages found a wide distribution among extension and research personnel, educational institutions, farm organizations, lending institutions and policy makers. Cooperating farmers received reports showing their individual information in comparison with group averages.

With this extensive background in the development of cost studies, the Economics and Policy Coordination Branch has begun to use computers in the preparation of cost data. Methods of computer simulation have now replaced the time consuming process of data collection, tabulation and analysis.

With this new approach, special attention is paid to the physical quantities and prices of inputs for each crop studied. The technology used in the production of various crops is carefully examined so that the computer models accurately reflect the appropriate production technology for each commodity.

Information on physical inputs is obtained from a number of sources, including:

1. Previous studies done by this Branch;
2. Surveys of the farm supply trade;
3. Technical input/output coefficients; and
4. The consensus of producers, researchers, and extension and agribusiness personnel.

THE DEVELOPMENT OF THE ACRES PROGRAM

A large number of computer programs that generate budgets and crop production cost estimates are now in existence. These computer programs vary in their degree of sophistication and in the amount of detail prepared. A large number of estimates covering a wide range of conditions can be generated quickly and efficiently. The effect of varying levels of technology, management practices and price levels can also be analyzed.

Cost of production estimates used in this report are based on the ACRES program. ACRES (Agricultural Crop Enterprises System) is a FORTRAN program originally written in Montana, adapted by Alberta Agriculture and recently modified and rewritten by the Economics and Policy Coordination Branch to meet Ontario conditions. All 1987 cost of production estimates in this report are based on this computer model.

METHODS AND PROCEDURES

The information used in the preparation of each production cost estimate in this report was prepared through the use of recent Economics and Policy Coordination Branch studies, plus consultations with producers and extension, research and agribusiness personnel.

For each crop cost estimate in this report, the data was organized into variable and fixed costs and totalled to arrive at the cost of production both on a per acre and per hectare basis. Variable costs are those which vary directly with the production of each crop grown. They include seed, plants, hired labor, fertilizer, herbicides, insecticides, fungicides, other materials, machinery operating costs, marketing charges and interest on operating capital. Fixed cost inputs are operator labor, management allowance, interest on land, machinery and buildings, depreciation on machinery and buildings, taxes on real estate (net of farm tax rebate), and other overhead cost items.

In this report, cash costs of production are also determined. Cash costs include total variable costs, interest on the debt portion of investment in tractors and machines, taxes and other overhead costs.

LABOR HOURS AND COSTS

The required number of labor hours was based on previous studies, as well as through discussions with those familiar with the production of each study crop. There are some crops which are harvested on a fixed rate per unit. For these crops, the labor hours and costs vary with the yields used in the cost estimate.

The operator labor hours were valued at $7.00 per hour. In addition, an allowance to management was made at the rate of 5 percent of the gross income.

The hired labor cost was calculated on a per hour basis and included benefits such as worker compensation, unemployment insurance, and the Canada Pension Plan. The rates varied according to area, crop and skill involved.

For some crops, piece work rates were used which were suggested by local farm labor pools. An allowance of 15 percent of basic earnings was added to cover benefits.

MATERIALS

The amount of each material input was based on commonly used practices. Input prices are based on averages charged by the trade in the area where the particular crop is grown. For most crops, the quantities of seed, plants, fertilizer nutrients and other inputs are given on a per hectare basis. Because of the multitude of products available, pesticides are grouped as herbicides, insecticides, fungicides, nematicides, etc. The cost and quantity of non-returnable containers is reported where applicable.

TRACTORS, MACHINES AND TRUCKS

Machinery complements used in the various crop production cost estimates were assumed to be five years old. Tractor and machine costs included depreciation, interest on investment, insurance, storage, repairs, maintenance, fuel and lubrication. If machines were used for other farming operations, costs were adjusted based on the proportion of use on the study crop. The declining balance method of depreciation was used, and a 15 percent rate to powered and a 10 percent rate to non-powered machines was applied.

Interest on machinery investment was calculated on the assumption that the equity portion was 70 percent and the debt portion was 30 percent of the total depreciated value. For this report, interest on equity was calculated at 4.6 percent, which was the average interest rate paid by chartered banks on savings accounts. The interest on the debt portion was based on the average prime rate of 9.0 percent, plus one for a total of 10.0 percent. Insurance and storage costs for machinery were based on 1.5 percent of their purchase price.

Repair and maintenance costs for individual machines were based on the fact sheet, "Cost of Owning and Operating Farm Machines", Agdex 825, Ontario Ministry of Agriculture and Food.

Fuel costs were based on the size of each tractor, truck or self-propelled machine used in the production operation. The following farmgate fuel prices were used: gasoline - 32.0 cents/litre; diesel - 33.0 cents/litre. The cost of oil, grease and filters was calculated at 15 percent of the fuel cost.

CUSTOM FARMWORK SERVICES

There are crops produced in Ontario where it is an accepted practice to use custom farmwork services to perform certain operations. Usually, these services are employed when the farmer needs specialized machines, such as harvesters, sprayers, fertilizer applicators and trucks. Most of these machines cannot be economically owned and operated by one producer. Custom costs were itemized on a per hectare or per acre basis.

LAND CHARGES

Determining the annual cost for land use is a controversial part in any study on production costs. During the past two decades, purchasers of farmland have been willing to pay more for it than can be justified from agricultural production. Purchasers believe the speculative aspect of land ownership in inflationary times offers benefits above those received from crop production. In deflationary times, however, this situation is reversed. For this reason, the appropriate interest rate used in calculating the interest cost on bare land for these crop production estimates is the real interest rate. The "real interest rate" is defined as the current lending rate of interest adjusted for inflation.

In this report, interest on land investment was calculated as follows:

1. The value of bare land was based on the average value for land in areas of Ontario where the production of each study crop predominates.

2. The interest rate applied was the prime rate discounted for the rate of inflation, which resulted in a 6.3 percent rate.

The farm real estate taxes used for each study crop reflect the area of production and are subject to Ontario's Farm Tax Reduction Program.

BUILDING COSTS

For those crops where buildings are used in grading, packing, and/or storage, a building cost allowance was made.

The initial cost of these structures was based on the assumption that buildings were five years old.

Depreciation	%
Steel and concrete structures	2.5
Wood structures	5.0
Greenhouses	2.0

The interest on building investment was set at 6.3 percent, which was also used in calculating interest on land investment.

Repairs and Maintenance	%
Steel structures	1.0
Concrete structures	0.25
Wood structures	1.5

Insurance

0.5 percent of initial costs

The cost of machine housing was covered under tractor and machine costs.

Allowances are made for the use of picking baskets, storage bins, and other pieces of reusable equipment required in the production of certain crops.

INTEREST ON OPERATING CAPITAL

Interest on operating capital required to finance each crop was calculated from the time an expenditure was made until the time income was generated from sales. Operating capital includes the cost of materials, fuel, repairs, hired labor and other cash items. In this study, the interest rate applied to operating capital was the average prime rate of 9.0 percent plus 1 percent for a rate of 10.0 percent.

OTHER OVERHEAD

This allowance covers such items as the study crop's share of utilities, accounting and administration costs, use of the farm automobile, and general farm maintenance.

OTHER COST CONSIDERATIONS

Depending on the crop studied, there are certain additional costs such as crop insurance, marketing board fees, grading charges and selling commissions.

YIELDS AND RETURNS

For each study crop presented in this report, a footnote to the table defines how the average yield and average price were calculated.

Additional information on average yields and prices is shown in the Appendix of this report.

GROSS MARGIN ANALYSIS

Gross margin is the amount above the variable costs that a crop contributes to the operator for his wages, management, and to the investment in machinery and land.

CASH ANALYSIS

The cash analysis section estimates the returns over cash costs. Cash costs comprise of all variable costs, as well as interest on the debt portion of tractor and machine investment, real estate taxes and other overhead costs.

Table 1. - Asparagus "Preplant Year" Costs: Estimated Cost of Production, 1987

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Fertilizer:		
10-20-30 400 kg/ha	103	41
Herbicides	109	44
Green manure seed	11	5
Tractor and machine costs:		
Repairs and maintenance	20	8
Fuel	25	10
Interest on operating capital	67	27
TOTAL	335	135
FIXED COSTS		
Operator labor, 7.4 hours/ha	52	21
Tractor and machine costs:		
Depreciation	51	21
Interest on investment	21	8
Insurance and storage	10	4
Interest on land, $4,450/ha @ 6.3% per annum	140	57
Taxes	20	8
TOTAL	294	119
TOTAL "PREPLANT YEAR" COSTS	629	254

Table 2. - Asparagus "Preplant Year" Costs: Operation Costs, Ontario, 1987

Operation	Times over	Labor hours		Labor, tractor and machine costs, $	
		per ha	per ac.	per ha	per ac.
Plowing	1	2.47	1.0	62.67	25.36
Discing	1	1.24	.5	27.26	11.03
Seeding green manure	1	1.24	.5	29.65	12.00
Spraying herbicide	1	1.24	.5	29.68	12.01
Fertilizing	1	1.24	.5	29.65	12.00

Table 3. - Asparagus "Planting Year" Costs: Estimated Cost of Production, 1987

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 74.1 hours/ha	389	157
Fertilizer:		
Superphosphate 370 kg/ha	106	42
Am. Nit. 250 kg/ha	46	19
Lime, 34.6 t/ha	69	28
Insecticides	69	28
Herbicides	187	76
Roots, 27,182/ha	2,175	880
Custom and rentals	153	62
Tractor and machine costs:		
Repairs and maintenance	84	34
Fuel	98	40
Interest on operating capital	506	205
TOTAL	3,882	1,571
FIXED COSTS		
Operator labor, 24.7 hours/ha	173	70
Tractor and machine costs:		
Depreciation	181	73
Interest on investment	73	29
Insurance and storage	36	15
Interest on land, $4,450/ha @ 6.3% per annum	280	113
Taxes	41	17
Other overhead costs	247	100
TOTAL	1,031	417
TOTAL "PLANTING YEAR" COSTS	4,913	1,988

Table 4. - Asparagus "Planting Year" Costs: Operation Costs, Ontario, 1987

Operation	Times over	Labor hours		Labor, tractor and machine costs, $	
		per ha	per ac.	per ha	per ac.
Plowing	1	2.47	1.0	62.27	25.36
Discing	2	2.47	1.0	54.56	22.08
Trenching	1	2.47	1.0	90.07	36.45
Fertilizing	1	1.24	.5	27.28	11.04
Planting	1	47.0	19.0	394.98	159.84
Replanting	1	2.47	1.0	12.97	5.25
Covering trench	1	2.47	1.0	62.05	25.11
Cultivating	2	2.47	1.0	66.37	26.86
Spraying herbicide	2	2.47	1.0	59.35	24.02
Hand hoeing	1	29.7	12.0	155.68	63.00
Fertilizing	1	1.24	.5	27.28	11.04
Spraying insecticide	2	2.47	1.0	94.25	38.14

Table 5. - Asparagus "Growth Year" Costs: Estimated Cost of Production, 1987

	Cost, $ per hectare	Cost, $ per acre
VARIABLE COSTS		
Hired labor, 12.4 hours/ha	65	26
Fertilizer:		
15-15-15 370 kg/ha	80	32
Am. Nit. 220 kg/ha	41	17
Insecticides	103	42
Fungicides	79	32
Herbicides	206	83
Tractor and machine costs:		
Repairs and maintenance	50	20
Fuel	32	13
Interest on operating capital	32	13
TOTAL	688	278
FIXED COSTS		
Operator labor, 9.3 hours/ha	65	26
Tractor and machine costs:		
Depreciation	80	32
Interest on investment	35	14
Insurance and storage	16	7
Interest on land, $4,450/ha @ 6.3% per annum	280	113
Taxes	41	17
Other overhead costs	247	100
TOTAL	764	309
TOTAL "GROWTH YEAR" COSTS	1,452	587

Table 6. - Asparagus "Growth Year" Costs: Operation Costs, Ontario, 1987

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Stalk shredding	1	.62	.25	18.85	7.63
Fertilizing	2	2.47	1.0	54.56	22.08
Cultivating	1	1.24	.5	33.19	13.43
Spraying herbicide	1	1.24	.5	29.68	12.01
Spraying pesticides	3	3.71	1.5	141.37	57.21
Hand hoeing	1	12.36	5.0	64.87	26.25

Table 7. - Asparagus Preharvest and Harvest Costs for Processing Purposes: Estimated Cost of Production, 1987

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor:		
Preharvest, 12.4 hours/ha	65	26
Harvest, 267 hours/ha	1,401	567
Fertilizer:		
15-15-15, 370 kg/ha	80	32
Am. Nit. 220 kg/ha	41	17
Insecticides	103	42
Fungicides	79	32
Herbicides	206	83
Tractor and machine costs:		
Repairs and maintenance	108	44
Fuel	221	89
Building, repairs	17	7
Marketing board & administration fee	98	40
Receiving station fees	111	45
Interest on operating capital	63	26
TOTAL	2,593	1050
FIXED COSTS		
Operator labor:		
Preharvest, 9.3 hours/ha	65	26
Harvest, 32.1 hours/ha	225	91
Management allowance, 5% of gross income	200	81
Tractor and machine costs:		
Depreciation	297	120
Interest on investment	113	45
Insurance and storage	56	23
Interest on land, $4,450/ha @ 6.3% per annum	280	113
Taxes	41	17
Building use	195	79
Other overhead costs	247	100
TOTAL	1,719	695
TOTAL PREHARVEST AND HARVEST COSTS	4,312	1,745
GROSS MARGIN ANALYSIS		
(Based on assumed yields of 2,018 kg/ha or 1,800 lbs./acre and assumed price of $1.98/kg or $0.90/lb.)		
Gross income	4,003	1,620
Variable costs:		
Amortized establishment costs[a]	714	289
Preharvest and harvest	2,593	1050
TOTAL	3,307	1,339
Gross margin	696	281
CASH ANALYSIS		
Gross income	4,003	1,620
Cash costs:		
Amortized establishment costs[a]	714	289
Preharvest and harvest[b]	2,935	1,189
TOTAL	3,649	1,478
Returns over cash costs	354	142

[a]Amortized establishment costs include preplant year costs, planting year costs, and growth year costs amortized over 15 years at a rate of 6.3 percent.

[b]Cash costs for preharvest and harvest include total variable costs plus interest on the debt portion of investment in tractors and machines of $54/ha ($22/ac.) plus taxes and other overhead costs.

Table 8. - Asparagus Preharvest and Harvest Costs for Processing Purposes: Operation Costs, Ontario, 1987

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Stalk shredding.....	1	.62	.25	18.85	7.63
Fertilizing.....	2	2.47	1.0	54.56	22.08
Cultivating.....	1	1.24	.5	33.19	13.43
Spraying herbicide.....	1	1.24	.5	29.68	12.01
Spraying pesticides.....	3	3.71	1.5	141.37	57.21
Hand hoeing.....	1	12.36	5.0	64.87	26.25
Harvesting.....	*	212.51	86.0	1,515.62	613.34
Grading and trimming.....	*	74.13	30.0	406.00	164.30
Delivery.....	*	12.36	5.0	286.03	115.75

*Operation performed as required.

Table 9. - Fresh Market Cabbage: Estimated Cost of Production, Ontario, 1987

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 173 hours/ha	899	364
Plants, 21,000/ha	663	268
Fertilizer, N - 169 kg/ha; P_2O_5 - 225 kg/ha; K_2O - 112 kg/ha	256	104
Herbicide	12	5
Insecticides	169	69
Crates, non-returnable, 1,853/ha	2,502	1,012
Tractor and machine costs:		
Repairs and maintenance	60	24
Fuel	70	28
Interest on operating capital	116	47
TOTAL	4,747	1,921
FIXED COSTS		
Operator labor, 21 hours/ha	151	61
Management allowance, 5% of gross income	269	109
Tractor and machine costs:		
Depreciation	128	52
Interest on investment	53	21
Insurance and storage	32	13
Interest on land, $4,448/ha @ 6.3% per annum	280	113
Taxes	22	9
Other overhead	62	25
TOTAL	997	403
TOTAL ALL COSTS[a]	5,744	2,324
COST PER UNIT	$150.76/tonne	$136.71/ton
(Based on average yields of 38.1 tonne/ha and 17.0 ton/acre)[b]		
GROSS MARGIN ANALYSIS		
(Based on average prices of $141.06/tonne and $128.00/ton)[c]		
Gross income	5,374	2,176
Total variable costs	4,747	1,921
Gross margin	627	255
CASH ANALYSIS		
Gross income	5,374	2,176
Cash costs[d]	4,856	1,965
Returns over cash costs	518	211

[a]Storage costs not considered.

[b]Five-year average yields for 1982-86.

[c]Two-year average prices 1984-85.

[d]Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $25/ha ($10/acre) plus taxes and other overhead costs.

Table 10. - Fresh Market Cabbage: Operation Costs, 1987

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Plowing	1	.99	.40	30.17	12.21
Discing	1	.49	.20	14.60	5.91
Spreading fertilizer	1	.37	.15	6.84	2.77
Spraying herbicide	1	.37	.15	7.24	2.93
Cultivating & levelling	1	.49	.20	13.86	5.61
Hauling plants & water	[a]	1.23	.50	26.00	10.52
Planting	1	29.60	12.00	305.12	123.48
Spraying insecticides	5	1.85	.75	36.13	14.62
Row cultivating	1	.49	.20	9.44	3.82
Row cultivating and sidedressing	1	.49	.20	10.53	4.26
Hand Hoeing (labor only)	1	17.30	7.00	86.49	35.00
Harvest and pack (labor only)	[a]	136.00	55.00	713.52	288.75
Load and haul to market[b]	[a]	4.94	2.00	133.19	53.90

[a]Operation performed as required.

[b]Hauling to market by use of a truck.

Table 11. - Fresh Market Carrots: Estimated Cost of Production, on Muck Soils, Ontario, 1987

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 47 hours/ha	241	98
Seed, pelleted, 1,700,000/ha	494	200
Fertilizer, N - 72 kg/ha; P_2O_5 - 28 kg/ha; K_2O - 140 kg/ha	127	52
Herbicides	175	71
Insecticides	63	26
Fungicides	172	70
Tractor and machine costs:		
Repairs and maintenance	133	53
Fuel	226	92
Pallet box repairs	31	12
Storage building repairs and maintenance	49	20
Electricity in storage	60	24
Interest on operating capital	114	46
TOTAL	1,885	764
FIXED COSTS		
Operator labor, 42 hours/ha	293	119
Management allowance, 5% of gross income	351	142
Tractor and machine costs:		
Depreciation	556	225
Interest on investment	320	130
Insurance and storage	118	48
Pallet box use	710	288
Storage building, interest & depreciation	433	175
Interest on land, $17,297/ha @ 6.3% per annum	1,090	441
Taxes	54	22
Other overhead	62	25
TOTAL	3,987	1,615
TOTAL ALL COSTS[a]	5,872	2,379
COST PER UNIT (Based on average yields of 60.52 tonne/ha and 27.00 ton/acre)[b]	$ 97.02/tonne	$88.11/ton
GROSS MARGIN ANALYSIS (Based on average prices of $115.96/tonne and $105.19/ton)[c]		
Gross income	7,018	2,840
Total variable costs	1,885	764
Gross margin	5,133	2,076
CASH ANALYSIS		
Gross income	7,018	2,840
Cash costs[d]	2,132	864
Returns over cash costs	4,886	1,976

[a]Carrots delivered to shipper in bulk bins, no grading and packaging costs are included.

[b]Five-year average yields 1982-86.

cThree-year average prices 1982-85.

[d]Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $131/ha ($53/acre) plus taxes and other overhead costs.

Table 12. - Fresh Market Carrots on Muck Soils: Operation Costs, Ontario, 1977

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Fall discing	1	.99	.40	29.21	11.82
Spring discing	1	.99	.40	29.21	11.82
Spreading fertilizer	1	.62	.25	12.63	5.11
Spraying herbicide	2	.99	.40	21.08	8.53
Discing and levelling	1	.99	.40	30.49	12.34
Seeding	1	2.47	1.00	70.94	28.71
Spraying (carrot weevil) .	2	.99	.40	21.08	8.53
Spraying (rust fly)	2	.99	.40	21.08	8.53
Spraying herbicide	1	.49	.20	10.53	4.26
Spraying (blight/rust fly)	2	.99	.40	21.08	8.53
Spray control (blight) ...	6	2.96	1.20	63.21	25.58
Hand weeding	1	9.88	4.00	49.42	20.00
Row cultivating and sidedressing	1	2.47	1.00	57.15	23.13
Hand harvesting	1	4.94	2.00	34.59	14.00
Combining	1	18.53	7.50	501.30	202.87
Hauling and unloading at farm storage	1	24.71	10.00	456.13	184.59
Load for market	*	9.88	4.00	80.00	32.28
Haul to market	*	2.47	1.00	62.44	25.27

*Operation performed as required.

Table 13. - Fresh Market Cauliflower: Estimated Cost of Production, Ontario, 1987

	Cost, $ per hectare	Cost, $ per acre
VARIABLE COSTS		
Hired labor, 341 hours/ha	1,754	710
Plants, 21,000/ha	441	178
Fertilizer, N - 162 kg/ha; P_2O_5 - 198 kg/ha; K_2O - 198 kg/ha	250	101
Herbicides	11	5
Insectidices	204	82
Tying bands	80	32
Crates, non-returnable, 1,483	2,002	810
Tractor and machine costs:		
Repairs and maintenance	77	31
Fuel	150	61
Interest on operating capital	124	50
TOTAL	5,093	2,060
FIXED COSTS		
Operator labor, 32.5 hours/ha	227	92
Management allowance, 5% of gross income	386	156
Tractor and machine costs:		
Depreciation	185	75
Interest on investment	74	30
Insurance and storage	57	25
Interest on land, $4,448/ha @ 6.3% per annum	280	113
Taxes	22	9
Other overhead	62	25
TOTAL	1,293	523
TOTAL ALL COSTS[a]	6,386	2,583
COST PER UNIT (Based on average yields of 19.7 tonne/ha and 8.8 ton/ac.)[b]	$324.16/tonne	$293.52/ton
GROSS MARGIN ANALYSIS (Based on average prices of $391.21/tonne and $355.00/ton)[c]		
Gross income	7,706	3,124
Total variable costs	5,093	2,060
Gross margin	2,613	1,064
CASH ANALYSIS		
Gross income	7,706	3,124
Cash costs[d]	5,213	2,108
Returns over cash costs	2,493	1,016

[a]Cauliflower is packed into crates at the farm before being hauled to shipper.

[b]Five-year average yields for 1982-86.

[c]Two-year average prices 1984-85.

[d]Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $36/ha ($14/acre) plus taxes and other overhead costs.

Table 14. - Fresh Market Cauliflower: Operation Costs, Ontario, 1987

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Plowing	1	.99	.40	30.17	12.21
Discing	1	.49	.20	14.60	5.91
Spreading fertilizer	1	.62	.25	12.63	5.11
Spraying herbicide	1	.37	.15	7.90	3.20
Cultivating & levelling	1	.49	.20	13.99	5.66
Hauling plants & water	[a]	2.47	1.00	51.99	21.04
Planting	1	29.60	12.00	323.21	130.80
Row cultivating	2	2.47	1.00	51.77	20.95
Hand hoeing (labor only)	1	37.10	15.00	185.23	75.00
Spray insecticides	5	1.85	.75	39.51	15.99
Row cultivating and side-dressing fertilizer	1	.49	.20	11.42	4.62
Tying heads	1	86.50	35.00	432.43	175.00
Harvesting (labor only)	[a]	185.00	75.00	972.97	393.75
Loading and hauling to market[b]	[a]	24.70	10.00	377.08	152.60

[a]Operation performed as required.

[b]Hauling to market by use of a truck.

Table 15. - Fresh Market Celery (Hand Harvest): Estimated Cost of Production on Muck Soils, Ontario, 1987

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 867 hours/ha	4,324	1,750
Seedlings, 40,000/ha	404	163
Fertilizer, N - 229 kg/ha; P_2O_5 - 111 kg/ha; K_2O - 334 kg/ha	607	246
Herbicide	95	39
Insecticides	182	74
Fungicides	136	55
Crates, non-returnable, 2,470	3,212	1,300
Tractor and machine costs:		
Repairs and maintenance	112	45
Fuel	242	98
Greenhouse repairs	34	14
Interest on operating capital	235	95
TOTAL	9,583	3,879
FIXED COSTS		
Operator labor, 79 hours/ha	555	225
Management allowance, 5% of gross income	828	335
Tractor and machine costs:		
Depreciation	265	107
Interest on investment	104	42
Insurance and storage	55	22
Greenhouse, depreciation, interest	156	63
Interest on land, $17,297/ha @ 6.3% per annum	1,090	441
Taxes	41	17
Other overhead	62	25
TOTAL	3,156	1,277
TOTAL ALL COSTS[a]	12,739	5,156
COST PER UNIT (Based on average yields of 70.17 tonne/ha and 31.30 ton/acre)[b]	$181.54/tonne	$164.73/ton
GROSS MARGIN ANALYSIS (Based on average prices of $235.88/tonne and $214.00/ton)[c]		
Gross income	16,552	6,698
Total variable costs	9,583	3,879
Gross margin	6,969	2,819
CASH ANALYSIS		
Gross income	16,552	6,698
Cash costs[d]	9,743	3,944
Returns over cash costs	6,809	2,754

[a]Includes costs of hand harvesting, washing and packing into crates at farm before delivery to shipper.

[b]Five-year average yields 1982-86.

[c]Three-year average prices 1983-85.

[d]Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $57/ha ($23/acre) plus taxes and other overhead costs.

Table 16. - Fresh Market Celery on Muck Soils: Operation Costs, Ontario, 1987

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Fall discing	1	2.47	1.00	72.37	29.29
Spreading fertilizer	1	.74	.30	15.07	6.10
Discing and levelling	1	.99	.40	30.20	12.22
Transplant in greenhouse	1	148.26	60.00	741.32	300.00
Greenhouse operations	1	14.83	6.00	103.78	42.00
Hauling plants	1	12.36	5.00	300.73	121.70
Planting in field by hand	1	172.97	70.00	864.87	350.00
Hand weeding	1	54.36	22.00	271.81	110.00
Sidedressing	2	4.94	2.00	94.44	38.22
Irrigating	3	44.48	18.00	559.32	226.35
Spraying weeds	2	1.48	.60	31.38	12.70
Spraying insecticide and fungicide	6	4.45	1.80	94.17	38.11
Cutting in field	*	444.79	180.00	2,224.00	900.00
Washing and field packing	*	24.70	10.00	124.00	50.00
Loading for market	*	12.36	5.00	86.49	35.00
Hauling to market	*	2.47	1.00	62.20	25.17

*Operation performed as required.

Table 17. - Head Lettuce: Estimated Cost of Production, on Muck Soils, Ontario, 1987

	Cost, $ per hectare	Cost, $ per acre
VARIABLE COSTS		
Hired labor, 536 hours/ha	2,681	1,085
Seed, pelleted, 270,000/ha	117	47
Fertilizer, N - 98 kg/ha; P_2O_5 - 98 kg/ha; K_2O - 98 kg/ha	141	57
Insecticides	354	143
Fungicides	86	35
Tractor and machine costs:		
Repairs and maintenance	122	49
Fuel	187	76
Crates, non-returnable, 835	2,785	1,127
Interest on operating capital	162	66
TOTAL	6,635	2,685
FIXED COSTS		
Operator labor, 44 hours/ha	310	125
Management allowance, 5% of gross income	440	178
Tractor and machine costs:		
Depreciation	299	121
Interest on investment	117	47
Insurance and storage	76	31
Interest on land, $17,297/ha @ 6.3% per annum	1,090	441
Taxes	41	17
Other overhead	62	25
TOTAL	2,435	985
TOTAL ALL COSTS[a]	9,070	3,670
COST PER UNIT (Based on average yields of 2,748 doz./ha and 1,112 doz./acre)[b]	$3.30/doz.	$3.30/doz.
GROSS MARGIN ANALYSIS (Based on average prices of $3.20/doz.)[c]		
Gross income	8,793	3,558
Total variable costs	6,635	2,685
Gross margin	2,158	873
CASH ANALYSIS		
Gross income	8,793	3,558
Cash costs[d]	6,798	2,751
Returns over cash costs	1,995	807

[a]Includes costs of harvesting, packing into crates and delivery to shipper.

[b]Five-year average yields for 1982-86.

[c]Three-year average prices 1983-85.

[d]Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $60/ha ($24/acre) plus taxes and other overhead costs.

Table 18. - Head Lettuce on Muck Soils: Operation Costs, Ontario, 1987

Operation	Times over	Labor hours		Labor, tractor and machine costs, $	
		per ha	per ac.	per ha	per ac.
Fall discing	1	.99	.40	28.94	11.71
Spreading fertilizer	1	.74	.30	15.07	6.10
Discing and levelling	1	.99	.40	30.19	12.22
Seeding	1	2.47	1.00	70.23	28.42
Hand thinning	1	123.55	50.00	617.76	250.00
Irrigating	1	29.65	12.00	260.58	105.45
Spraying insecticides	6	4.45	1.80	94.17	38.11
Spraying fungicides	5	3.71	1.50	78.48	31.76
Hand hoeing	1	98.84	40.00	494.21	200.00
Row cultivating and sidedressing	1	2.47	1.00	56.71	22.95
Harvesting and packing ...	*	291.58	118.00	1,457.92	590.00
Spreading crates	*	12.35	5.00	335.82	135.90
Hauling to market	*	12.35	5.00	331.12	137.00

*Operation performed as required.

Table 19. - Peppers for Fresh Market: Estimated Cost of Production, Ontario, 1987

	Cost, $ per hectare	Cost, $ per acre
VARIABLE COSTS		
Hired labor, 180 hours/ha	939	380
Plants, 27,180/ha	557	226
Fertilizer, N - 204 kg/ha; P_2O_5 - 168 kg/ha; K_2O - 168 kg/ha	201	81
Herbicides	15	6
Insecticides	163	66
Fungicides	99	40
Crates, non-returnable, 1,285/ha	1,092	442
Tractor and machine costs:		
Repairs and maintenance	128	52
Fuel	104	42
Interest on operating capital	82	33
TOTAL	3,380	1,368
FIXED COSTS		
Operator labor, 41.5 hours/ha	291	118
Management allowance, 5% of gross income	230	93
Tractor and machine costs:		
Depreciation	212	85
Interest on investment	83	34
Insurance and storage	54	22
Interest on land, $4,448/ha @ 6.3% per annum	280	113
Taxes	22	9
Other overhead	62	25
TOTAL	1,234	499
TOTAL ALL COSTS	4,614	1,867
COST PER UNIT (Based on average yields of 11.4 tonne/ha and 5.1 ton/acre)[a]	$404.73/tonne	$366.08/ton
GROSS MARGIN ANALYSIS (Based on average prices of $402.23/tonne and $365.00/ton)[b]		
Gross income	4,585	1,862
Total variable costs	3,380	1,368
Gross margin	1,205	494
CASH ANALYSIS		
Gross income	4,585	1,862
Cash costs[c]	3,504	1,418
Returns over cash costs	1,081	444

[a]Five-year average yields for 1982-86.

[b]Two-year average prices 1984-85.

[c]Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $40/ha ($16/acre) plus taxes and other overhead costs.

Table 20. - Peppers for Fresh Market: Operation Costs, Ontario, 1987

Operation	Times over	Labor hours		Labor, tractor and machine costs, $	
		per ha	per ac.	per ha	per ac.
Plowing	1	1.48	.60	45.27	18.32
Discing	1	.99	.40	29.21	11.82
Spreading fertilizer	1	.99	.40	18.16	7.35
Spraying herbicide	1	.99	.40	19.27	7.80
Cultivating and levelling	1	.99	.40	27.77	11.24
Hauling plants and water..	*	2.96	1.20	63.43	25.67
Planting	1	17.80	7.20	183.08	74.09
Row cultivating	2	2.47	1.00	41.29	16.71
Hand hoeing (labor only)..	1	17.30	7.00	86.49	35.00
Row cultivating and sidedressing fertilizer	1	1.48	.60	28.00	11.33
Spraying insecticides	7	6.92	2.80	134.85	54.57
Spraying fungicides	2	1.98	.80	38.52	15.59
Harvesting and packing (labor only)	*	128.00	52.00	674.60	273.00
Loading in field	*	29.60	12.00	362.75	149.80
Hauling to market (labor only)	*	7.41	3.00	51.89	21.00

*Operation performed as required.

Table 21. - Fresh Market Potatoes: Estimated Cost of Production, Ontario, 1987

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 24 hours/ha	132	54
Seed, potato	486	197
Seed, rye	13	5
Seed treatment	46	19
Fertilizer, N - 168 kg/ha; P_2O_5 - 168 kg/ha; K_2O - 168 kg/ha	218	88
Herbicides	158	64
Insecticides	167	68
Fungicides	113	46
Topkill	43	17
Tractor and machine costs:		
Repairs and maintenance	163	66
Fuel	218	88
Marketing fees	38	16
Interest on operating capital	135	55
TOTAL	1,930	783
FIXED COSTS		
Operator labor, 17 hours/ha	117	47
Management allowance, 5% of gross income	129	52
Tractor and machine costs:		
Depreciation	314	127
Interest on investment	129	52
Insurance and storage	71	29
Interest on land, $3,707/ha @ 6.3% per annum	234	95
Taxes	13	5
Other overhead	37	15
TOTAL	1,044	422
TOTAL ALL COSTS[a]	2,974	1,205
COST PER UNIT	$149.90/tonne	$6.81/cwt.
(Based on average yields of 19.84 tonne/ha and 177 cwt/acre)[b]		
GROSS MARGIN ANALYSIS		
(Based on average prices of $130.04/tonne and $5.90/cwt)[c]		
Gross income	2,580	1044
Total variable costs	1,930	783
Gross margin	650	261
CASH ANALYSIS		
Gross income	2,580	1044
Cash costs[d]	2,042	828
Returns over cash costs	538	216

[a]Does not include storage and marketing costs.

[b]Based on three-year's average yield, 1983-85.

[c]Price estimated based on three year's average return, 1984-86.

[d]Cash costs include variable costs, plus interest on debt portion of investment in tractors and machines of $61/ha ($25/acre) plus taxes and other overhead costs.

Table 22. - Fresh Market Potatoes: Operation Costs, Ontario, 1987

Operation	Times over	Labor hours		Labor, tractor and machine costs, $	
		per ha	per ac.	per ha	per ac.
Fall plowing	1	0.82	0.33	28.57	11.56
Discing	2	0.74	0.30	27.85	11.27
Plant rye	1	0.99	0.40	37.14	15.03
Spring plowing	1	0.99	0.40	34.62	14.01
Discing	1	0.37	0.15	13.91	5.63
Field cultivating	1	0.37	0.15	12.78	5.17
Cutting seed	1	0.86	0.35	21.15	8.56
Hauling fertilizer	1	0.62	0.25	33.85	13.70
Hauling seed	1	1.24	0.50	62.30	25.21
Planting	1	4.34	1.75	97.04	39.27
Row cultivating	1	1.36	0.55	32.35	13.09
Hilling	1	0.82	0.33	18.19	7.36
Spraying herbicide	1	0.40	0.16	12.01	4.86
Spraying insecticide and fungicide	6	1.63	0.66	57.18	23.14
Spraying topkill	1	0.27	0.11	9.54	3.86
Digging and windrowing ..	1	2.47	1.00	72.15	29.20
Harvesting with combine..	1	7.41	3.00	128.15	51.86
Hauling to storage	1	7.41	3.00	376.30	152.28
Unloading and grading ...	1	7.41	3.00	69.34	28.06

Table 23. - Sweet Corn for Fresh Market (Hand Harvest): Estimated Cost of Production, Ontario, 1987

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 95 hours/ha	500	202
Seed, 13.5 kg/ha	124	50
Fertilizer, N - 126 kg/ha; P_2O_5 - 64 kg/ha; K_2O - 74 kg/ha	115	47
Herbicide	49	20
Insecticide	115	47
Crates, non-returnable, 445/ha	356	144
Tractor and machine costs:		
Repairs and maintenance	75	30
Fuel	67	27
Custom work	12	5
Interest on operating capital	35	14
TOTAL	1,448	586
FIXED COSTS		
Operator labor, 25 hours/ha	93	38
Management allowance, 5% of gross income	122	49
Tractor and machine costs:		
Depreciation	134	55
Interest on investment	55	22
Insurance and storage	30	12
Interest on land, $4,448/ha @ 6.3% per annum	280	113
Taxes	22	9
Other overhead costs	62	25
TOTAL	798	323
TOTAL ALL COSTS[a]	2,246	909
COST PER UNIT (Based on average yields of 2,137 doz./ha and 865 doz./acre)[b]	$1.05/doz	$1.05/doz
GROSS MARGIN ANALYSIS (Based on average prices of $1.14/doz.)[c]		
Gross income	2,436	986
Total variable costs	1,448	586
Gross margin	988	400
CASH ANALYSIS		
Gross income	2,436	986
Cash costs[d]	1,558	631
Returns over cash costs	878	355

[a]Sweet corn is hand harvested and packed into crates at the farm before being hauled to shipper.

[b]Five-year average yields 1982-86.

[c]Two-year average prices 1984-85.

[d]Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $26/ha ($11/acre) plus taxes and other overhead costs.

Table 24. - Sweet Corn for Fresh Market (Hand Harvest): Operation Costs, Ontario, 1987

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Plowing	1	.79	.32	24.14	9.77
Discing	1	.99	.40	29.21	11.82
Spreading fertilizer	1	.99	.40	18.16	7.35
Spraying herbicide	1	.99	.40	19.27	7.80
Cultivating and harrowing	1	.99	.40	28.00	11.33
Hauling seed and fertilizer	[a]	.30	.12	5.88	2.38
Planting	1	.59	.24	23.30	9.43
Row cultivating	2	1.58	.64	26.42	10.69
Custom applying "N" and herbicide	1	--	--	11.74	4.75
Spray insecticides	4	3.95	1.60	77.05	31.18
Picking and hauling to farm yard	[a]	69.20	28.00	478.76	193.75
Sort and pack (labor only)	[a]	24.70	10.00	129.73	52.50
Haul to market[b]	[a]	2.47	1.00	66.59	26.95
Disc down stalks	1	.99	.40	27.97	11.32

[a]Operation performed as required.

[b]Using a truck.

-- not applicable

Table 25. - Field Tomatoes for Fresh Market: Estimated Cost of Production, Ontario, 1987

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 417 hours/ha	2,181	882
Plants, 24,710/ha	618	250
Fertilizer: Plant Starter 6-24-24, 49 litres/ha	14	5
N - 225 kg/ha; P_2O_5 - 93 kg/ha;		
K_2O - 270 kg/ha	238	96
Herbicide	14	5
Insecticide	34	14
Fungicide	165	67
Containers, non-returnable, 2,224/ha	3,425	1,386
Use of picking baskets	49	20
Tractor and machine costs:		
Repairs and maintenance	159	65
Fuel	235	95
Interest on operating capital	178	72
TOTAL	7,310	2,957
FIXED COSTS		
Operator labor, 39 hours/ha	266	108
Management allowance, 5% of gross income	523	212
Tractor and machine costs:		
Depreciation	352	142
Interest on investment	136	55
Insurance and storage	90	36
Interest on land, $4,448/ha @ 6.3% per annum	280	113
Taxes	22	9
Other overhead	62	25
TOTAL	1,731	700
TOTAL ALL COSTS[a]	9,041	3,657
COST PER UNIT	$394.80/tonne	$358.53/ton
(Based on average yields of 22.9 tonne/ha and 10.2 ton/acre)[b]		
GROSS MARGIN ANALYSIS		
(Based on average prices of $457.33/tonne and $415.00/ton)[c]		
Gross income	10,473	4,233
Total variable costs	7,310	2,957
Gross margin	3,163	1,276
CASH ANALYSIS		
Gross income	10,473	4,233
Cash costs[d]	7,460	3,018
Returns over cash costs	3,013	1,215

[a]Tomatoes are graded and packed into containers at farm before being shipped to dealer.

[b]Five-year average yields for 1982-86.

[c]Two-year average prices 1984-85.

[d]Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $66/ha ($27/acre) plus taxes and other overhead costs.

Table 26. - Field Tomatoes for Fresh Market: Operation Costs, Ontario, 1987

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Plowing	1	1.48	.60	45.27	18.32
Discing	1	.99	.40	29.21	11.82
Spreading fertilizer	1	.99	.40	18.16	7.35
Spraying herbicide	1	.99	.40	19.27	7.80
Field cultivating and levelling	1	.99	.40	27.77	11.24
Hauling plants & water	[a]	1.98	.80	41.59	16.83
Planting	1	17.80	7.20	183.08	74.09
Row cultivating	1	.90	.40	16.53	6.69
Hand hoeing (labor only)	1	24.70	10.00	123.55	50.00
Row cultivate and sidedress	3	2.96	1.20	56.02	22.67
Spraying for insect and disease control	6	5.93	2.40	115.60	46.78
Harvesting and packing	[a]	380.00	154.00	2,344.41	948.75
Hauling to market[b]	[a]	14.80	6.00	399.57	161.70

[a]Operation performed as required.

[b]Using a truck.

Table 27. - Yellow Seed Onions: Estimated Cost of Production, on Muck Soils, Ontario, 1987

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 86.5 hours/ha	437	177
Seed, pelleted, treated, 1,110,000/ha	767	310
Fertilizer, N - 147 kg/ha; P_2O_5 - 49 kg/ha; K_2O - 247 kg/ha	267	108
Herbicides	810	328
Insecticides	189	76
Fungicides	289	117
Sprout inhibitor	48	19
Plastic covers	25	10
Tractor and machine costs:		
Repairs and maintenance	162	66
Fuel	145	59
Pallet box repairs	22	9
Storage building and repairs	39	16
Electricity, used in storage	39	16
Interest on operating capital	171	69
TOTAL	3,410	1,380
FIXED COSTS		
Operator labor, 36 hours/ha	250	101
Management allowance, 5% of gross income	276	112
Tractor and machine costs:		
Depreciation	421	170
Interest on investment	185	75
Insurance and storage	141	57
Pallet box use	499	202
Storage building, interest and depreciation	445	180
Interest on land, $17,297/ha @ 6.3% per annum	1,090	441
Taxes	53	22
Other overhead	62	25
TOTAL	3,422	1,385
TOTAL ALL COSTS[a]	6,832	2,765
COST PER UNIT (Based on average yields of 41.2 tonne/ha and 18.4 ton/acre)[b]	$165.82/tonne	$150.27/ton
GROSS MARGIN ANALYSIS (Based on average prices of $133.81/tonne and $121.25/ton)[c]		
Gross income	5,513	2,231
Total variable costs	3,410	1,380
Gross margin	2,103	851
CASH ANALYSIS		
Gross income	5,513	2,231
Cash costs[d]	3,614	1,463
Returns over cash costs	1,899	768

[a]Onions are delivered to shipper in bulk bins, costs of grading and bagging are not included.
[b]Five-year average yields for 1982-86.
[c]Three-year average prices 1983-85.
[d]Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $89/ha ($36/acre) plus taxes and other overhead costs.

Table 28. - Yellow Seed Onions on Muck Soils: Operation Costs, Ontario, 1987

Operation	Times over	Labor hours		Labor, tractor and machine costs, $	
		per ha	per ac.	per ha	per ac.
Fall discing	1	.99	.40	29.20	11.82
Spreading fertilizer	1	.62	.25	12.63	5.11
Spraying herbicide	1	.49	.20	10.53	4.26
Discing and levelling, spring	1	.99	.40	30.49	12.34
Seeding (onion magget control)	1	2.47	1.00	70.94	28.71
Spraying herbicide, post emerge	10	4.94	2.00	105.36	42.64
Spraying insecticide	5	2.47	1.00	52.68	21.32
Spraying fungicide	9	4.44	1.80	94.84	38.38
Spraying sprout inhibitor	1	.49	.20	10.53	4.26
Hand weeding	1	42.00	17.00	210.00	85.00
Row cultivating and sidedressing	1	2.47	1.00	57.16	23.13
Pulling and windrowing	1	4.94	2.00	199.93	80.91
Combining	1	19.77	8.00	297.56	120.42
Stacking pallet boxes in field	*	4.94	2.00	79.62	32.22
Hauling to storage	*	4.94	2.00	148.95	60.28
Unloading at storage	*	4.94	2.00	24.71	10.00
Load and haul to market	*	12.35	5.00	122.44	49.55

*Operation performed as required.

Table 29. - Cabbage for Processing: Estimated Cost of Production, Ontario, 1987

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 37 hours/ha	185	75
Plants, 29,450/ha	249	101
Fertilizer, N - 169 kg/ha; P_2O_5 - 225 kg/ha; K_2O - 112 kg/ha	256	104
Herbicide	12	5
Insecticides	152	61
Tractor and machine costs:		
Repairs and maintenance	75	30
Fuel	98	40
Custom harvest and haul	568	230
Crop insurance	96	39
Marketing fees	27	11
Interest on operating capital	15	6
TOTAL	1,733	702
FIXED COSTS		
Operator labor, 16.4 hours/ha	115	47
Management allowance, 5% of gross income	122	49
Tractor and machine costs:		
Depreciation	120	49
Interest on investment	51	20
Insurance and storage	23	9
Interest on land, $4,448/ha @ 6.3% per annum	280	113
Taxes	22	9
Other overhead	62	25
TOTAL	795	321
TOTAL ALL COSTS	2,528	1,023
COST PER UNIT (Based on average yields of 41.5 tonne/ha and 18.5 ton/acre)[a]	$60.92/tonne	$55.30/ton
GROSS MARGIN ANALYSIS (Based on average prices of $58.62/tonne and $53.19/ton)[b]		
Gross income	2,433	984
Total variable costs	1,733	702
Gross margin	700	282
CASH ANALYSIS		
Gross income	2,433	984
Cash costs[c]	1,842	746
Returns over cash costs	591	238

NOTE: Plant cost includes only one-half of plant cost, as processor supplies plants for early crop and the grower for the late crop.

[a]Five-year average yields for 1982-86.

[b]1987 contract price.

[c]Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $25/ha ($10/acre) plus taxes and other overhead costs.

Table 30. - Cabbage for Processing: Operation Costs, Ontario, 1987

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Plowing	1	.99	.40	40.28	16.30
Discing	1	.37	.15	18.01	7.29
Spreading fertilizer	1	.37	.15	9.12	3.69
Spraying herbicide	1	.37	.15	9.88	4.00
Field cultivating, harrowing and packing	2	.74	.30	32.17	13.02
Hauling plants & water	*	1.24	.50	38.65	15.64
Planting	1	29.70	12.00	366.80	148.44
Spraying insecticides	4	1.48	.60	39.56	16.01
Row cultivating	1	.49	.20	12.53	5.07
Hand hoeing (labor only)	1	17.30	7.00	86.49	35.00
Row cultivating and sidedressing fertilizer	1	.49	.20	13.62	5.51
Custom harvest	1	--	--	289.11	117.00
Custom hauling	1	--	--	279.23	113.00

*Operation performed as required.

Table 31. - Cucumbers for Processing: Estimated Cost of Production, Ontario, 1987

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 541 hours/ha	2,706	1,095
Seed, 3.36 kg/ha	89	36
Fertilizer, N - 118 kg/ha; P_2O_5 - 168 kg/ha; K_2O - 168 kg/ha	201	81
Insecticide	41	17
Fungicide	133	54
Tractor and machine costs:		
Repairs and maintenance	68	27
Fuel	67	27
Bee rental	54	22
Use of picking baskets	90	36
Crop insurance	86	35
Marketing and grading fees	52	21
Interest on operating capital	30	12
TOTAL	3,617	1,463
FIXED COSTS		
Operator labor, 5.4 hours/ha	96	39
Management allowance, 5% of gross income	234	95
Tractor and machine costs:		
Depreciation	87	35
Interest on investment	36	15
Insurance and storage	19	8
Interest on land, $4,448/ha @ 6.3% per annum	280	113
Taxes	22	9
Other overhead	62	25
TOTAL	836	339
TOTAL ALL COSTS	4,453	1,802
COST PER UNIT (Based on average yields of 20.8 tonne/ha and 9.3 ton/acre)[a]	$214.09/tonne	$193.76/ton
GROSS MARGIN ANALYSIS (Based on average prices of $223.94/tonne and $203.21/ton)[b]		
Gross income	4,658	1,890
Total variable costs	3,617	1,463
Gross margin	1,041	427
CASH ANALYSIS		
Gross income	4,658	1,890
Cash costs[c]	3,719	1,504
Returns over cash costs	939	386

[a]Five-year average yields for 1982-86.

[b]1987 price based on 1986 average price less 4.4 percent.

[c]Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $18/ha ($7/acre) plus taxes and other overhead costs.

Table 32. - Cucumbers for Processing: Operation Costs, Ontario, 1987

Operation	Times over	Labor hours		Labor, tractor and machine costs, $	
		per ha	per ac.	per ha	per ac.
Plowing	1	.99	.40	40.28	16.30
Discing	1	.37	.15	18.00	7.29
Spreading fertilizer	1	.37	.15	9.12	3.69
Cultivating, harrowing and packing	1	.37	.15	16.09	6.51
Planting	1	.99	.40	32.74	13.25
Hand hoeing (labor only)	1	17.30	7.00	86.49	35.00
Row cultivating	1	.49	.20	12.53	5.07
Spraying fungicides	3	1.11	.45	29.67	12.01
Row cultivating and side-dressing fertilizer	2	1.24	.50	34.03	13.77
Spraying insecticide	1	.37	.15	9.88	4.00
Picking (labor only)	*	524.00	212.00	2,619.31	1,060.00
Loading in field	*	4.94	2.00	113.92	46.10
Hauling to market[b]	*	2.47	1.00	56.96	23.05

*Operation performed as required.

[b]Hauling with tractor and wagons.

Table 33. - Green Peas for Processing: Estimated Cost of Production, Ontario, 1987

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Seed, 252 kg/ha	250	101
Fertilizer, N - 13 kg/ha; P_2O_5 - 25 kg/ha; K_2O - 38 kg/ha	42	17
Herbicide	37	14
Tractor and machine costs:		
Repairs and maintenance	25	10
Fuel	30	12
Custom harvesting and hauling	301	122
Crop insurance	62	25
Marketing and grading fees	15	6
Interest on operating capital	6	3
TOTAL	768	310
FIXED COSTS		
Operator labor, 4 hours/ha	28	11
Management allowance, 5% of gross income	71	29
Tractor and machine costs:		
Depreciation	36	15
Interest on investment	16	7
Insurance and storage	7	3
Interest on land, $3,336/ha @ 6.3% per annum	210	85
Taxes	15	6
Other overhead	37	15
TOTAL	420	171
TOTAL ALL COSTS	1,188	481
COST PER UNIT	$311.81/tonne	$282.94/ton
(Based on average yields of 3.81 tonne/ha and 1.70 ton/acre)[a]		
GROSS MARGIN ANALYSIS		
(Based on average prices of $373.80/tonne and $339.16/ton)[b]		
Gross income	1,424	577
Total variable costs	768	310
Gross margin	656	267
CASH ANALYSIS		
Gross income	1,424	577
Cash costs[c]	828	334
Returns over cash costs	596	243

[a]Five-year average yields 1982-86.

[b]1987 price based on the 1986 average price received.

[c]Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $8/ha ($3/acre) plus taxes and other overhead costs.

Table 34. - Green Peas for Processing: Operation Costs, Ontario, 1987

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Plowing	1	.99	.40	40.28	16.30
Discing	1	.35	.14	16.83	6.81
Spreading fertilizer	1	.35	.14	8.52	3.45
Spraying herbicides	2	.69	.28	18.48	7.48
Cultivating, harrowing and packing	1	.35	.14	15.00	6.07
Hauling seed	1	.25	.10	7.73	3.13
Planting	1	.99	.40	35.61	14.41
Custom harvesting and hauling	1	--	--	301.47	122.00

-- not applicable

Table 35. - Green and Wax Beans for Processing: Estimated Cost of Production, Ontario, 1987

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Seed, 89 kg/ha	290	117
Fertilizer, N - 17 kg/ha; P_2O_5 - 34 kg/ha; K_2O - 50 kg/ha	42	17
Herbicide	16	7
Tractor and machine costs:		
Repairs and maintenance	24	9
Fuel	28	11
Custom harvesting and hauling	316	128
Custom spraying	15	6
Crop insurance	94	38
Marketing and grading fees	21	9
Interest on operating capital	7	3
TOTAL	853	345
FIXED COSTS		
Operator labor, 3.6 hours/ha	25	10
Management allowance, 5% of gross income	73	30
Tractor and machine costs:		
Depreciation	36	14
Interest on investment	15	6
Insurance and storage	4	2
Interest on land, $3,336/ha @ 6.3% per annum	210	85
Taxes	15	6
Other overhead	37	15
TOTAL	415	168
TOTAL ALL COSTS	1,268	513
COST PER UNIT	$207.87/tonne	$188.60/ton
(Based on average yields of 6.10 tonne/ha and 2.72 ton/acre)[a]		
GROSS MARGIN ANALYSIS		
(Based on average prices of $240.24/tonne and $218.00/ton)[b]		
Gross income	1,465	593
Total variable costs	853	345
Gross margin	612	248
CASH ANALYSIS		
Gross income	1,465	593
Cash costs[c]	912	369
Returns over cash costs	553	224

[a]Five-year average yields for 1982-86.

[b]1987 contract price.

[c]Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $7/ha ($3/acre) plus taxes and other overhead costs.

Table 36. - Green and Wax Beans for Processing: Operation Costs, Ontario, 1987

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Plowing	1	.99	.40	40.28	16.30
Discing	1	.35	.14	16.83	6.81
Spreading fertilizer	1	.35	.14	8.52	3.45
Spraying herbicide	1	.35	.14	9.24	3.74
Cultivating, harrowing and packing	1	.35	.14	15.00	6.07
Hauling seed	1	.25	.10	7.73	3.13
Planting	1	.49	.20	22.51	9.11
Custom spray herbicide	1	--	--	14.83	6.00
Row cultivating	1	.44	.18	11.27	4.56
Custom harvesting and hauling	1	--	--	315.90	127.84

-- not applicable

Table 37. - Lima Beans for Processing: Estimated Cost of Production, Ontario, 1987

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Seed, 59 kg/ha	94	38
Fertilizer, N - 17 kg/ha; P_2O_5 - 34 kg/ha; K_2O - 50 kg/ha	42	17
Herbicide	57	23
Tractor and machine costs:		
Repairs and maintenance	32	13
Fuel	32	13
Custom harvesting and hauling	227	92
Crop insurance	94	38
Marketing fees	13	5
Interest on operating capital	5	2
TOTAL	596	241
FIXED COSTS		
Operator labor, 4.7 hours/ha	33	13
Management allowance, 5% of gross income	63	25
Tractor and machine costs:		
Depreciation	42	17
Interest on investment	19	8
Insurance and storage	8	3
Interest on land, $4,448/ha @ 6.3% per annum	280	113
Taxes	22	9
Other overhead	37	15
TOTAL	504	203
TOTAL ALL COSTS	1,100	444
COST PER UNIT (Based on average yields of 2.33 tonne/ha and 1.04 ton/acre)[a]	$472.10/tonne	$426.92/ton
GROSS MARGIN ANALYSIS (Based on average prices of $537.22/tonne and $487.50/ton)[b]		
Gross income	1,252	507
Total variable costs	596	241
Gross margin	656	266
CASH ANALYSIS		
Gross income	1,252	507
Cash costs[c]	664	269
Returns over cash costs	588	238

[a]Five-year average yields for 1982-86.

[b]1987 contract price.

[c]Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $9/ha ($4/acre) plus taxes and other overhead costs.

Table 38. - Lima Beans: Operation Costs, Ontario, 1987

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Plowing	1	.99	.40	40.28	16.30
Discing	1	.34	.14	16.83	6.81
Spreading fertilizer	1	.34	.14	8.52	3.45
Spraying herbicide	1	.34	.14	9.24	3.74
Cultivating, harrowing and packing	2	.69	.28	30.02	12.15
Hauling seed	1	.25	.10	7.73	3.13
Planting	1	.49	.20	22.51	9.11
Spraying herbicide	1	.34	.14	9.24	3.74
Rotary hoeing	1	.34	.14	9.12	3.69
Row cultivating	1	.54	.22	13.79	5.58
Custom swathing	1	--	--	21.00	8.50
Custom harvesting and hauling	1	--	--	205.59	83.20

-- not applicable

Table 39. - Peppers for Processing: Estimated Cost of Production, Ontario, 1987

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 178 hours/ha	889	360
Plants, 27,180/ha	537	217
Fertilizer, N - 118 kg/ha; P_2O_5 - 168 kg/ha; K_2O - 168 kg/ha	202	82
Herbicide	15	6
Insecticides	163	66
Allowance for use of picking baskets	61	25
Tractor and machine costs:		
Repairs and maintenance	109	44
Fuel	155	63
Crop insurance	138	56
Marketing fees	44	18
Interest on operating capital	39	16
TOTAL	2,352	953
FIXED COSTS		
Operator labor, 27.8 hours/ha	195	79
Management allowance, 5% of gross income	195	79
Tractor and machine costs:		
Depreciation	181	73
Interest on investment	74	30
Insurance and storage	35	14
Interest on land, $4,448/ha @ 6.3% per annum	280	113
Taxes	22	9
Other overhead	62	25
TOTAL	1,044	422
TOTAL ALL COSTS	3,396	1,375
COST PER UNIT	$232.28/tonne	$210.89/ton
(Based on average yields of 14.62 tonne/ha and 6.52 ton/acre)[a]		
GROSS MARGIN ANALYSIS		
(Based on average prices of $266.24/tonne and $241.59/ton)[b]		
Gross income	3,892	1,575
Total variable costs	2,352	953
Gross margin	1,540	622
CASH ANALYSIS		
Gross income	3,892	1,575
Cash costs[c]	2,472	1,002
Returns over cash costs	1,420	573

[a]Five-year average yields for 1982-86.

[b]Price based on 1986 average price.

[c]Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $36/ha ($15/acre) plus taxes and other overhead costs.

Table 40. - Peppers for Processing: Operation Costs, Ontario, 1987

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Plowing	1	.99	.40	40.28	16.30
Discing	1	.37	.15	18.00	7.29
Spreading fertilizer	1	.37	.15	9.12	3.69
Spraying herbicide	1	.37	.15	9.88	4.00
Cultivating, harrowing and packing	2	.74	.30	32.17	13.02
Hauling plants	*	1.24	.50	38.65	15.64
Planting	1	29.60	12.00	366.80	148.44
Row cultivating	1	.62	.25	15.67	6.34
Spraying insecticides	7	2.59	1.05	69.24	28.02
Hand hoeing (labor only)	1	17.30	7.00	86.49	35.00
Row cultivating and sidedressing	1	.74	.30	20.41	8.26
Hand picking (labor only)	*	133.43	54.00	667.18	270.00
Loading in field	*	14.83	6.00	207.93	84.15
Hauling to market[b]	*	2.47	1.00	56.96	23.05

*Operation performed as required.

[b]Hauling to market by using a tractor and wagons.

Table 41. - Potatoes for Processing: Estimated Cost of Production, Ontario, 1987

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 30.0 hours/ha	163	66
Cover crop seed	33	13
Potato seed	579	234
Seed treatment	46	19
Fertilizer, N - 185 kg/ha; P_2O_5 - 185 kg/ha; K_2O - 185 kg/ha	242	98
Herbicide	110	44
Insecticides	189	76
Fungicides	96	39
Topkill	43	17
Tractor and machine costs:		
Repairs and maintenance	195	79
Fuel	274	111
Custom work	42	17
Marketing fees	38	16
Interest on operating capital	152	61
TOTAL	2,202	890
FIXED COSTS		
Operator labor, 17.3 hours/ha	116	47
Management allowance, 5% of gross income	154	62
Tractor and machine costs:		
Depreciation	367	149
Interest on investment	129	52
Insurance and storage	102	41
Interest on land, $3,707/ha @ 6.3% per annum	234	95
Taxes	13	5
Other overhead	37	15
TOTAL	1,152	466
TOTAL ALL COSTS[a]	3,354	1,356
COST PER UNIT	$157.46/tonne	$7.14/cwt.
(Based on average yields of 21.3 tonne/ha and 190 cwt./acre)[b]		
GROSS MARGIN ANALYSIS		
(Based on average prices of $144.62/tonne and $6.56/cwt)[c]		
Gross income	3,080	1,246
Total variable costs	2,202	890
Gross margin	878	356
CASH ANALYSIS		
Gross income	3,080	1,246
Cash costs[d]	2,324	939
Returns over cash costs	756	307

[a]This does not include storage costs.

[b]Three year's average yields for 1983-85.

[c]Price estimated based on three year's average return, 1984-86.

[d]Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $72/ha ($29/acre) plus taxes and other overhead costs.

Table 42. - Potatoes for Processing: Operation Costs, Ontario, 1987

Operation	Times over	Labor hours		Labor, tractor and machine costs, $	
		per ha	per ac.	per ha	per ac.
Discing	1	1.24	0.50	46.41	18.78
Seeding cover crop	1	0.62	0.25	23.25	9.41
Spring plowing (cover crops)	1	1.24	0.50	43.26	17.51
Spreading lime (custom)	1	--	--	42.01	17.00
Chisel plowing	1	1.24	0.50	39.24	15.88
Discing	1	1.24	0.50	46.41	18.78
Field cultivating	2	0.27	0.33	28.39	11.49
Cutting seed	1	0.86	0.35	21.15	8.56
Hauling fertilizer and seed	1	2.47	1.00	125.78	50.90
Planting	1	1.78	0.72	60.27	24.39
Row cultivating	1	0.69	0.28	16.65	6.74
Hilling	1	1.24	0.50	28.34	11.47
Hauling water for spraying	1	1.24	0.50	63.60	25.74
Spraying herbicide	1	0.49	0.20	15.02	6.08
Spraying insecticide	1	0.32	0.13	10.97	4.44
Spraying fungicide	5	1.73	0.70	60.39	24.44
Spraying topkill	1	0.32	0.13	10.97	4.44
Digging and windrowing	1	2.47	1.00	88.80	35.94
Harvesting with combine	1	7.41	4.00	136.80	55.36
Hauling to storage	1	7.41	3.00	373.94	151.53
Unload at storage	1	7.41	4.00	82.31	33.31

Table 43. - Red Beets for Processing: Estimated Cost of Production, Ontario, 1987

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 62 hours/ha	309	125
Seed, 7 kg/ha	68	27
Fertilizer, N - 123 kg/ha; P_2O_5 - 142 kg/ha; K_2O - 101 kg/ha	181	73
Herbicide	285	116
Micronutrient Sprays	18	7
Tractor and machine costs:		
Repairs and maintenance	49	20
Fuel	62	25
Custom harvesting and hauling	533	216
Crop insurance	69	28
Marketing fees	30	12
Interest on operating capital	40	16
TOTAL	1,644	665
FIXED COSTS		
Operator labor, 13 hours/ha	91	37
Management allowance, 5% of gross income	132	53
Tractor and machine costs:		
Depreciation	79	32
Interest on investment	34	14
Insurance and storage	15	6
Interest on land, $6,672/ha @ 6.3% per annum	420	170
Taxes	22	9
Other overhead	37	15
TOTAL	830	336
TOTAL ALL COSTS	2,474	1,001
COST PER UNIT (Based on average yields of 32.40 tonne/ha and 14.45 ton/acre)[a]	$76.36/tonne	$69.27/ton
GROSS MARGIN ANALYSIS (Based on average prices of $81.77/tonne and $74.10/ton)[b]		
Gross income	2,649	1,071
Total variable costs	1,644	665
Gross margin	1,005	406
CASH ANALYSIS		
Gross income	2,649	1,071
Cash costs[c]	1,719	695
Returns over cash costs	930	376

[a]Five-year average yields for 1982-86.

[b]1987 price based on 1986 average price.

[c]Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $16/ha ($6/acre) plus taxes and other overhead costs.

Table 44. - Red Beets for Processing: Operation Costs, Ontario, 1987

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Plowing	1	.79	.32	32.25	13.05
Discing	1	.40	.16	19.22	7.78
Spreading fertilizer	1	.40	.16	9.74	3.94
Spraying herbicide	2	.79	.32	21.05	8.52
Cultivating and harrowing	1	.40	.16	15.96	6.46
Planting	1	1.98	.80	65.48	26.50
Row cultivating	3	3.56	1.44	90.24	36.52
Hand hoeing (labor only)	1	61.80	25.00	308.88	125.00
Spraying foliar micronutrients	2	.79	.32	21.13	8.55
Custom harvesting	1	--	--	266.63	107.90
Custom hauling	1	--	--	266.63	107.90
Helping harvest (labor only)	*	2.47	1.00	17.30	7.00

-- not applicable

*Operation performed as required.

Table 45. - Sweet Corn for Processing: Estimated Cost of Production, Ontario, 1987

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Seed, 9 kg/ha	51	21
Fertilizer, N -111 kg/ha; P_2O_5 - 68 kg/ha; K_2O - 68 kg/ha	107	43
Herbicide	53	21
Insecticide	14	6
Tractor and machine costs:		
Repairs and maintenance	26	11
Fuel	32	13
Custom spray and apply "N"	27	11
Custom harvest and haul	156	63
Crop insurance	32	13
Marketing fees	10	4
Interest on operating capital	4	2
TOTAL	512	208
FIXED COSTS		
Operator labor, 3.9 hours/ha	27	11
Management allowance, 5% of gross income	47	19
Tractor and machine costs:		
Depreciation	38	15
Interest on investment	17	7
Insurance and storage	7	3
Interest on land, $3,336/ha @ 6.3% per annum	210	85
Taxes	15	6
Other overhead	38	15
TOTAL	399	161
TOTAL ALL COSTS	911	369
COST PER UNIT (Based on average yields of 11.44 tonne/ha and 5.10 ton/acre)[a]	$79.63/tonne	$72.35/ton
GROSS MARGIN ANALYSIS (Based on average prices of $82.86/tonne and $75.19/ton)[b]		
Gross income	948	384
Total variable costs	512	208
Gross margin	436	176
CASH ANALYSIS		
Gross income	948	384
Cash costs[c]	572	232
Returns over cash costs	376	152

[a]Five-year average yields for 1982-86.

[b]1987 contract price used at 70% domestic and 30% export.

[c]Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $8/ha ($3/acre) plus taxes and other overhead costs.

Table 46. - Sweet Corn for Processing: Operation Costs, Ontario, 1987

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Plowing	1	.99	.40	40.28	16.30
Discing	1	.34	.14	16.83	6.81
Spreading fertilizer	1	.34	.14	8.52	3.45
Cultivating, harrowing and packing	1	.34	.14	15.00	6.07
Hauling seed	1	.25	.10	7.73	3.13
Planting	1	.49	.20	22.51	9.11
Spraying herbicide	1	.34	.14	9.24	3.74
Row cultivating	1	.44	.18	11.27	4.56
Custom apply "N" and herbicide	1	--	--	13.59	5.50
Custom spray insecticide	1	--	--	13.59	5.50
Custom harvest and haul	1	--	--	155.63	62.98
Discing stalks	1	.34	.14	16.83	6.81

-- not applicable

Table 47. - Tomatoes for Processing, Hand Harvest, Estimated Cost of Production, Ontario, 1987

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 334 hours/ha	1,777	719
Plants, 22,485/ha	445	180
Fertilizer: plant starter, 10 litres/hectare	14	6
N - 113 kg/ha; P_2O_5 - 94 kg/ha; K_2O - 269 kg/ha	185	75
Herbicide	64	26
Insecticides and fungicides (custom applied, materials included)	374	151
Basket use for picking, 247/ha	121	49
Other materials	22	9
Tractor and machine costs:		
Repairs and maintenance	85	34
Fuel	139	56
Custom hauling	369	149
Crop insurance	120	49
Marketing board and grading fees	82	33
Interest on operating capital	63	25
TOTAL	3,860	1,561
FIXED COSTS		
Operator labor, 18 hours/ha	129	52
Management allowance, 5% of gross income	255	103
Tractor and machine costs:		
Depreciation	148	60
Interest on investment	61	25
Insurance and storage	30	12
Land rental charges	432	175
Other overhead	37	15
TOTAL	1,092	442
TOTAL ALL COSTS	4,952	2,003
COST PER UNIT (Based on average yields of 41.8 tonne/ha and 18.6 ton/acre)[a]	$118.46/tonne	$107.69/ton
GROSS MARGIN ANALYSIS (Based on average prices of $121.89/tonne and $110.61/ton)[b]		
Gross income	5,095	2,057
Total variable costs	3,860	1,561
Gross margin	1,235	496
CASH ANALYSIS		
Gross income	5,095	2,057
Cash costs[c]	3,927	1,588
Returns over cash costs	1,168	469

[a]Five-year average yields for 1982-86.

[b]Using option A, agtron reading of 26, average cull tare of 3% and the 1987 price schedule.

[c]Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $30/ha ($12/acre) plus taxes and other overhead costs.

Table 48. - Tomatoes for Processing, Hand Harvest: Operation Costs, Ontario, 1987

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Plowing	1	.74	.30	30.22	12.23
Discing	1	.37	.15	18.00	7.29
Spreading fertilizer	1	.37	.15	9.12	3.69
Field cultivating and harrowing	1	.37	.15	14.95	6.05
Spraying herbicide	1	.37	.15	9.88	4.00
Incorporate Spray	1	.37	.15	14.78	5.98
Hauling water and plants	a	1.73	.70	46.38	18.77
Planting	1	27.18	11.00	237.52	96.12
Row cultivating	2	.99	.40	21.47	8.69
Row cultivating and sidedressing	1	.62	.25	14.75	5.97
Hand hoeing (labor only)	1	17.30	7.00	86.49	35.00
Apply ethrel	b	.25	.10	6.60	2.67
Hand picking (labor only)	a	273.55	110.70	1,443.61	584.21
Spreading baskets	a	5.93	2.40	67.29	27.23
Loading in field	a	22.24	9.00	347.68	140.70
Hauling to processor (custom)	a	--	--	368.68	149.20

[a]Operation performed as required.

[b]Applied on 20% of the acreage.

Table 49. - Tomatoes for Processing, Machine Harvest: Estimated Cost of Production, Ontario, 1987

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 73.4 hours/ha	394	160
Plants, 33,360 kg/ha	658	266
Fertilizer: plant starter, 10 litres/ha	14	6
N - 90 kg/ha; P_2O_5 - 94 kg/ha; K_2O - 269 kg/ha	170	69
Herbicide	61	25
Insecticides and fungicides	219	88
Other materials	79	32
Tractor and machine costs:		
Repairs and maintenance	271	110
Fuel	205	83
Crop insurance	127	51
Marketing board and grading fees	82	33
Interest on operating capital	53	21
TOTAL	2,333	944
FIXED COSTS		
Operator labor, 34 hours/ha	136	55
Management allowance, 5% of gross income	250	101
Tractor and machine costs:		
Depreciation	1,050	425
Interest on investment	335	136
Insurance and storage	119	48
Land rental charges	556	225
Other overhead	37	15
TOTAL	2,483	1,005
TOTAL ALL COSTS	4,816	1,949
COST PER UNIT (Based on average yields of 41.7 tonne/ha and 18.6 ton/acre)[a]	$115.49/tonne	$104.78/ton
GROSS MARGIN ANALYSIS (Based on average prices of $119.46/tonne and $108.37/ton)[b]		
Gross income	4,981	2,016
Total variable costs	2,333	944
Gross margin	2,648	1,072
CASH ANALYSIS		
Gross income	4,981	2,016
Cash costs[c]	2,530	1,024
Returns over cash costs	2,451	992

[a]Five-year average yields for 1982-86.

[b]Using option B, agtron reading of 28, average cull tare of 4% and the 1987 price schedule.

[c]Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $160/ha ($65/acre) plus taxes and other overhead costs.

Table 50. - Tomatoes for Processing, Machine Harvest: Operation Costs, Ontario, 1987

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Plowing	1	.62	.25	25.18	10.19
Spreading fertilizer	1	.49	.20	11.39	4.61
Shape beds (fall)	1	.62	.25	33.68	13.63
Reshape beds (spring)	1	.62	.25	33.68	13.63
Incorporate herbicide (using shaper)	1	.62	.25	33.68	13.63
Haul water and plants	[a]	.84	.34	16.68	6.75
Planting	1	27.08	10.96	209.94	84.96
Control weeds (using shaper)	2	.99	.40	53.89	21.81
Control weeds and sidedress (using shaper)	2	1.24	.50	67.36	27.26
Hand hoe (labor only)	1	17.30	7.00	86.49	35.00
Spray fungicides	6	2.22	.90	92.24	37.33
Spray insecticides	2	.74	.30	30.76	12.45
Haul water for spraying	[a]	.44	.18	14.21	5.75
Apply ethrel	[b]	.49	.20	21.28	8.61
Harvesting	1	23.23	9.40	1,179.67	477.40
Hauling from harvester	1	8.30	3.36	260.70	105.50
Delivery to processor	[a]	6.92	2.80	363.64	147.16

[a]Operation performed as required.

[b]Applied on 75% of the acreage.

Appendix Table 1. - Average Yields per Acre for Vegetables, Ontario, 1982-1986

Crop	Unit	1982	1983	1984	1985	1986	Avg. 5 Yr.
				- '000 acres -			
Asparagus (f & p)	lb	1.6	1.1	1.1	1.2	1.4	1.3
Beans, green & wax (f)	lb	5.7	5.6	5.7	4.9	3.9	5.2
Beans, green & wax (p)	lb	4.9	4.9	5.7	5.6	5.1	5.2
Beans, lima (p)	lb	2.3	2.5	2.7	2.0	1.2	2.1
Beets, topped	lb	27.2	25.5	28.7	28.7	26.0	27.2
Beets, bunching	lb	12.4	10.8	12.9	14.6	6.1	11.4
Broccoli (f & p)	lb	11.6	11.8	9.1	7.6	7.2	9.5
Brussel sprouts	lb	6.3	9.7	10.1	9.3	4.2	7.9
Cabbage	lb	37.8	34.0	34.5	34.5	25.0	33.2
Carrots, bunching	lb	12.5	10.1	10.2	9.7	8.2	10.1
Carrots, topped (f & p) ...	lb	63.4	62.6	65.1	51.7	43.3	57.2
Cauliflower (f & p)	lb	19.3	20.1	21.3	16.3	20.1	19.4
Celery (f & p)	lb	65.3	65.4	70.3	56.0	53.1	62.0
Corn, sweet (f)	dz	0.9	0.8	0.9	0.9	0.8	0.9
Corn, sweet (p)	lb	10.3	9.2	10.6	10.2	10.4	10.1
Cucumber, field (f)	lb	16.4	17.7	15.7	11.9	10.5	14.4
Cucumber, field (p)	lb	19.2	18.2	18.3	18.4	19.5	18.7
Lettuce head (f)	dz	1.2	1.1	1.2	1.3	1.2	1.2
Onions, dry sets	lb	20.2	16.4	18.6	21.2	18.2	18.9
Onions, dry silverskin	lb	10.1	10.1	10.1	11.5	7.0	9.8
Onions, dry spanish	lb	29.6	25.1	23.1	18.4	26.9	24.6
Onions, dry yellowseed	lb	39.0	37.1	31.6	43.6	36.1	37.5
Onions, bunching	lb	14.9	13.6	16.2	17.0	13.0	14.9
Parsnips	lb	19.4	17.5	17.6	16.6	17.5	17.7
Peas, green (p)	lb	3.2	2.0	3.4	4.1	3.4	3.2
Peppers (f & p)	lb	11.4	11.1	10.8	10.7	9.5	10.7
Potatoes	lb	21.1	19.8	19.1	20.5	20.4	20.2
Pumpkin & Squash	lb	25.9	24.6	27.0	20.3	27.9	25.1
Radishes	lb	5.7	9.1	9.3	10.1	11.5	9.1
Rutabagas	lb	43.7	24.8	36.0	28.8	32.5	33.2
Spinach	lb	5.4	5.6	8.0	9.0	5.5	6.7
Tomatoes (f)	lb	19.9	20.1	20.2	21.2	27.7	21.8
Tomatoes (p)	lb	37.9	29.6	39.3	39.1	39.1	37.0

Note: (f) fresh; (f & p) fresh & processing; (p) processing
n/a not available

Source: Seasonal Fruit & Vegetable Report, Annual Summary
Economics and Policy Coordination Branch, OMAF.

Appendix Table 2. - Average Prices per Unit for Vegetables, Ontario, 1982-1986

Crop	Unit	1982	1983	1984	1985	1986	Avg. 5 Yr.
				- cents -			
Asparagus (f & p)	1b	107.1	102.8	101.0	99.3	96.0	101.2
Beans, green & wax (f)	1b	26.3	27.0	28.0	26.9	38.4	29.3
Beans, green & wax (f)	1b	11.2	11.0	11.6	11.7	10.9	11.3
Beans, Lima (p)	1b	23.6	23.0	24.3	24.6	24.4	24.0
Beets, topped	1b	4.6	5.0	5.4	31.3	5.8	10.4
Beets, bunching	1b	25.3	43.4	41.0	3.8	33.7	29.4
Broccoli (f & p)	1b	28.6	34.2	34.6	34.7	38.1	34.0
Brussel sprouts	1b	42.9	48.2	44.3	35.0	41.6	42.4
Cabbage (f & p)	1b	5.4	9.8	5.5	7.3	11.6	7.9
Carrots, bunching	1b	3.4	8.1	3.1	27.2	24.4	13.2
Carrots, topped (f & p) ...	1b	18.4	16.7	16.3	4.8	7.0	12.6
Cauliflower (f & p)	1b	13.9	17.8	15.3	20.8	19.8	17.5
Celery (f & p)	1b	8.5	13.6	8.2	10.2	10.4	10.2
Corn, sweet (f)	dz	100.3	120.4	105.0	121.0	128.0	114.9
Corn, sweet (p)	1b	3.7	3.8	3.6	3.6	3.3	3.6
Cucumber (f)	1b	12.3	12.8	11.0	17.5	17.5	14.2
Cucumber (p)	1b	10.2	9.6	10.5	10.4	10.2	10.2
Cucumber, greenhouse	dz	384.0	506.0	630.9	524.5	535.6	516.2
Lettuce (f)	dz	271.5	347.7	331.0	291.0	321.0	312.4
Onions, dry sets	1b	6.3	11.8	10.9	10.1	15.9	11.0
Onions, dry silverskins ...	1b	40.0	40.3	41.0	42.0	35.1	39.7
Onions, dry spanish	1b	14.3	14.8	15.2	13.2	14.6	14.4
Onions, dry yellowskins ...	1b	4.4	11.0	4.4	4.0	11.6	7.1
Onions, bunching	1b	29.8	34.1	34.8	39.8	41.7	36.0
Parsnips	1b	14.0	16.0	16.0	16.0	15.2	15.4
Peas green (p)	1b	15.8	15.0	16.1	17.0	16.5	16.1
Peppers (f & p)	1b	13.6	14.7	15.1	20.5	21.9	17.2
Potatoes	1b	4.4	7.8	6.8	5.3	9.0	6.7
Pumpkin & Squash	1b	1.7	2.0	1.7	1.8	1.8	1.8
Radishes	1b	21.6	26.3	33.7	33.8	26.9	28.5
Rutabagas	1b	4.2	7.1	3.9	5.5	4.9	5.1
Spinach	1b	23.5	29.8	29.0	20.3	31.2	26.8
Tomatoes (f)	1b	17.6	20.1	20.2	19.2	27.0	20.8
Tomatoes, greenhouse	1b	52.7	60.8	80.1	59.2	75.8	65.7
Tomatoes (p)	1b	5.3	5.1	5.6	5.6	5.6	5.4

Note: (f) fresh; (f & p) fresh & processing; (p) processing; n/a not available

Source: Seasonal Fruit and Vegetable Report, Annual Summary, Economics and Policy Coordination Branch, OMAF.

Appendix Table 3. - Average Yields per Hectare for Vegetables, Ontario 1982-1986

Crop	1982	1983	1984	1985	1986	Avg. 5 Yr.
			- tonnes/ha -			
Asparagus (f & p)	1.8	1.2	1.2	1.3	1.6	1.4
Beans, green & wax (f) ...	6.4	6.3	6.4	5.5	4.4	5.8
Beans, green & wax (f) ...	5.5	5.5	6.4	6.3	5.7	5.9
Beans, lima (p)	2.5	2.8	3.0	1.8	1.1	2.2
Beets, topped	30.5	28.6	32.2	32.1	29.1	30.5
Beets, bunching	13.9	11.9	14.5	16.4	6.8	12.7
Broccoli (f & p)	13.0	13.2	10.2	8.5	8.0	10.6
Brussel sprouts	7.1	10.9	11.3	10.5	4.7	8.9
Cabbage (f & p)	42.4	38.1	38.7	38.7	28.6	37.3
Carrots, bunching	14.0	11.3	11.4	11.0	9.2	11.4
Carrots, topped (f & p) ..	71.1	70.2	73.0	58.1	48.7	64.2
Cauliflower (f & p)	21.6	22.5	23.9	18.3	22.5	21.8
Celery (f & p)	73.2	73.3	78.8	62.8	59.6	69.5
Corn, sweet (f)	6.1	5.5	6.1	5.8	5.1	5.7
Corn, sweet (p)	11.6	10.3	11.9	11.4	11.7	11.4
Cucumber (f)	18.4	19.8	17.6	13.3	11.8	16.2
Cucumber (p)	21.5	20.4	20.5	20.7	21.9	21.0
Lettuce (f)	19.9	16.5	20.2	22.0	20.2	19.8
Onions, dry sets	22.6	18.4	20.9	23.8	20.4	21.2
Onions, dry silverskins ..	11.3	11.3	11.3	12.8	7.8	10.9
Onions, dry spanish	33.2	28.1	25.9	20.6	30.1	27.6
Onions, dry yellowskins ..	43.7	41.6	35.4	48.9	40.5	42.0
Onions, bunching	16.7	17.9	18.2	19.1	14.6	17.3
Parsnips	21.7	19.6	19.7	18.6	19.6	19.8
Peas, green (p)	3.5	2.2	3.8	4.6	3.8	3.6
Peppers (f & p)	12.8	12.4	12.1	12.5	10.6	12.1
Potatoes	23.7	22.2	21.4	22.9	21.7	22.4
Pumpkin & Squash	29.0	27.6	30.3	22.8	31.3	28.2
Radishes	6.4	10.2	10.4	11.3	12.9	10.2
Rutabagas	49.0	27.8	31.2	32.3	36.5	35.4
Spinach	6.1	6.3	9.0	10.1	6.2	7.5
Tomatoes (f)	22.3	22.5	22.6	23.7	31.0	24.4
Tomatoes (p)	42.6	33.2	44.1	43.8	43.8	41.5

Note: (f) fresh; (f & p) fresh & processing; (p) processing; n/a not available

Source: Seasonal Fruit and Vegetable Report, Annual Summary, Economics and Policy Coordination Branch, OMAF.

Appendix Table 4. - Average Price per Kilogram for Vegetables, Ontario, 1982-1986

Crop	1982	1983	1984	1985	1986	Avg. 5 Yr.
			- cents/kg -			
Asparagus (f & p)	236.1	226.7	223.5	219.3	211.9	223.5
Beans, green & wax (f) ...	57.9	59.4	61.7	59.2	84.7	64.6
Beans, green & wax (f) ...	24.6	24.3	25.6	25.8	24.0	24.9
Beans, lima (p)	52.0	50.7	53.6	54.2	53.7	52.8
Beets, topped	10.2	11.0	11.9	8.5	74.3	23.2
Beets, bunching	55.8	95.6	90.4	69.0	12.8	64.7
Broccoli (f & p)	73.1	75.4	76.3	76.6	84.1	77.1
Brussel sprouts	94.5	106.4	97.7	77.2	91.7	93.5
Cabbage (f & p)	12.0	21.7	12.1	16.2	25.6	17.5
Carrots, bunching	7.4	18.0	6.8	60.0	53.8	29.2
Carrots, topped (f & p) ..	40.6	36.8	35.9	10.5	15.4	27.8
Cauliflower (f & p)	30.6	39.8	33.7	45.9	43.7	38.7
Celery (f & p)	18.8	30.0	18.1	22.4	22.9	22.4
Corn sweet (f)	36.8	44.6	38.6	44.4	47.1	42.3
Corn sweet (p)	8.2	8.4	7.9	8.0	7.3	8.0
Cucumber (f)	27.1	28.1	24.3	38.7	38.6	31.4
Cucumber (p)	22.5	21.2	23.2	23.0	22.4	22.5
Cucumber, greenhouse	105.9	139.4	173.9	144.5	147.6	142.3
Lettuce (f)	39.9	51.1	48.7	42.8	47.2	45.9
Onions, dry sets	14.0	25.9	24.0	22.3	35.1	24.3
Onions, dry silverskins ..	88.3	88.7	90.4	92.6	77.4	87.5
Onions, dry spanish	31.5	32.6	33.5	29.1	32.2	31.8
Onions, dry yellowskins ..	9.8	24.2	9.7	8.8	25.6	15.6
Onions, bunching	65.8	75.3	76.7	87.7	91.9	79.5
Parsnips	31.0	35.3	35.3	35.2	33.5	34.1
Peas, green (p)	34.8	33.1	33.3	37.4	36.3	35.0
Peppers (f & p).....	30.0	32.4	33.3	45.2	48.3	37.8
Potatoes	9.8	17.2	15.0	11.6	19.8	14.7
Pumpkin & Squash	3.7	4.4	3.8	4.0	4.0	4.0
Radishes	47.6	58.0	74.3	74.5	59.3	62.7
Rutabagas	9.2	15.7	8.6	12.2	10.8	11.3
Spinach	51.7	65.8	63.9	44.6	68.8	59.0
Tomatoes (f)	38.8	45.3	44.5	42.4	59.5	46.1
Tomatoes, greenhouse	116.3	134.0	176.6	130.4	167.1	144.9
Tomatoes (p)	11.8	11.2	12.4	12.4	12.3	12.0

Note: (f) fresh; (f & p) fresh & processing; (p) processing; n/a not available

Source: Seasonal Fruit and Vegetable Report, Annual Summary, Economics and Policy Coordination Branch, OMAF.

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